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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/627,781	07/28/2000	Hideki Nakahara	2000 1048A	3104

7590 11/14/2003

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EXAMINER

TRAN, THIEN D

ART UNIT PAPER NUMBER

2665

DATE MAILED: 11/14/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/627,781

Applicant(s)

NAKAHARA ET AL.

Examiner

Thien D Tran

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 19 is/are rejected.
- 7) ☒ Claim(s) 18 and 20-24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

Art Unit: 2665

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-17, 19 are rejected under 35 U.S.C. 102(e) as being participated by Kleider et al (U.S Patent No. 6,487,252 B1), hereinafter Kleider.

Regarding claim 1, Kleider discloses a scheme for transmitting an OFDM signal from a transmission side to a reception side (col.1 lines 20-25), wherein

said OFDM signal includes both a data symbol having data therein, and a pilot symbol having a frequency component predetermined in analog signals, which have amplitude and phase (col.3 lines 5-20),

on said transmission side, said pilot symbol is inserted before or after one or more said data symbols, and is transmitted together with one or more said data symbols (col.3 lines 15-60), and

on said reception side, the received pilot symbol is utilized for compensating a frequency response variation of a transmission path resulted from any one or more of

distortion observed in the transmission path, out-of-synchronization with passage of time, frequency drift, and residual phase error (col.7 lines 27-30).

Regarding claim 2, Kleider discloses that every subcarrier included in said pilot symbol is a pilot carrier predetermined in amplitude and phase (col.3 lines 5-20).

Regarding claim 3, Kleider discloses that pilot symbol is plurally and sequentially inserted before or after one or more said data symbols (figure 5).

Regarding claim 4, Kleider discloses that pilot symbol is periodically inserted before or after one or more said data symbols (col.7 lines 35-50).

Regarding claim 5, Kleider discloses that pilot symbol is non-periodically inserted before or after one or more said data symbols (figure 5).

Regarding claims 6, 7, Kleider discloses that pilot symbol is adaptively changed in frequency and number for insertion depending on a state of the transmission path (col.6 lines 10-30).

Regarding claim 8, Kleider discloses that the frequency response variation of said transmission path is compensated by using a compensation vector calculated, as a time series linear approximation, from a difference in frequency response between any two pilot symbols closest to each other (col.6 lines 20-35).

Regarding claim 9, Kleider discloses that the frequency response variation of said transmission path resulted from either one or both of said frequency drift and said residual phase error is compensated by using a value calculated, as a time series linear approximation, from a difference in phase between any two pilot symbols closest to each other (col.8 lines 10-50).

Regarding claim 10, Kleider discloses that the frequency response variation of transmission path is compensated by using an average value taken for a phase error among pilot carriers in said pilot symbol (col.8 lines 40-50).

Regarding claim 11, Kleider discloses that average value is calculated by weighing each amplitude value for the pilot carriers (col.11 lines 1-10).

Regarding claim 12, Kleider discloses an OFDM signal transmitter for transmitting an OFDM signal towards a reception side, comprising:

- a data symbol generator for generating an OFDM data symbol after inputting data for transmission;

- a pilot symbol generator for generating an OFDM pilot symbol; and

- a symbol selector for switching between signals provided by said data symbol generator and said pilot symbol generator so that said pilot symbol is inserted before or after one or more said data symbols (col.3 lines 35-50).

Regarding claims 13, 14, 19, Kleider discloses that data symbol generator comprises:

- a frequency-domain data symbol generator for generating a frequency-domain data symbol after inputting data for transmission; and

- an inverse Fourier transformer for subjecting a signal provided by said frequency-domain data symbol generator to inverse Fourier transform, and said pilot symbol generator comprises:

- a frequency-domain pilot symbol generator for generating a frequency-domain pilot symbol; and

an inverse Fourier transformer for subjecting a signal provided by said frequency-domain pilot symbol generator to inverse Fourier transform (col.4 lines 5-50).

Regarding claims 15-17, Kleider discloses that transmission path frequency response compensator calculates a compensation vector for compensation, by referring to a frequency response of a pilot symbol, a frequency response of another pilot symbol closest thereto, and a frequency response of a reference pilot symbol provided on a reception side, so that a frequency response of said received data symbol corresponds to that of said reference pilot symbol (col.7 line25 col.8 line 60).

Allowable Subject Matter

3. Claims 18, 20-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

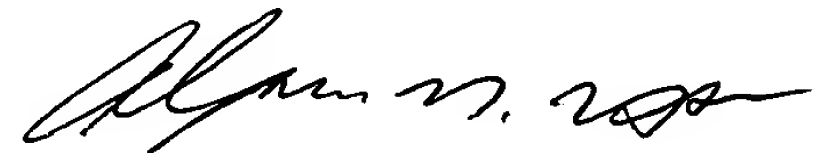
-Bohnke et al (US Patent No. 6,567,374) discloses data and pilot mapping in an OFDM system.

-Kim et al (US Patent No. 6,172,993 B1) discloses frame synchronization method and apparatus for use in digital communication system utilizing OFDM method.

-Alamouti et al (US Patent No. 6,560,209 B1) discloses method for frequency division duplex communication.

6. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Thien Tran whose telephone number is (703) 308-4388. The examiner can normally be reached on Monday-Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.



**ALPUS H. HSU
PRIMARY EXAMINER**